Application of an E-learning Quality Guide with Checklists

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Abstract. This paper was produced based on the "Quality Guide of Open and Distance Learning" produced in a project subsidized by the Socrates E-learning European Cooperation Programme. It was written by Alfredo Soeiro (University of Porto, Portugal), Brian Perry (University of Hertfordshire, UK), Steve Bennett (University of Hertfordshire, UK), Jef Van den Branden (LINOV-Katholike Universitat Leuven, Belgium), José Collado Medina (Universidad Nacional de Educacion a Distancia, Spain), Juan Manuel Moreno Olmedilla (Universidad Nacional de Educacion a Distancia, Spain), Samuel Gento Palacios (Universidad Nacional de Educacion a Distancia, Spain), László Komáromi (SZÁMALK Training and Consulting Centre, Hungary) and András Bardócz-Tódor (Centre for Educational Services, Hungary). It is composed by a summarized description of five sequential phases that are described each one by a set of questions organized in checklists. It is a simplified approach with practical and relevant relevance.

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1 What is Quality in E-learning

The major part of the referred guide concentrates on the stages of this model. The stages are defined in five parts which are the elements of the e-learning course development cycle:

a) Analysis
b) Design and Development
c) Production
d) Delivery
e) Evaluation

Quality, with this guide, means to satisfactorily meet a specific, well-defined objective. Therefore the five processes are executed one after the other and repeated with the necessary improvements defined by the answers given to a series of checklists. These five checklists are the tools used to satisfy the defined objectives for the e-learning course.

1.1 Quality in general

Two major aspects of quality are quality management and quality assurance. Both of them can be built up introduced and used standardised, or independent from standards. In the following text we attempt to draw up the difference between them. Quality management and quality assurance differ basically in that while quality management (whose most general form is TQM, the systematic cooperation of the entire organisation in the interest of the quality of the product or service for the satisfaction of the involved people) is an internal matter of each organisation, the essence of quality assurance is external evaluation based on convention, we could say, it is the extension of quality beyond the organisation. The effect and result of TQM appears in the service and it only affects the market through the quality of the service. The process of the service itself can be entirely secret, or a process which is incomprehensible for the customer (as e.g. a heart operation): the essence is the quality of the final result, which is justified by the "market" on the basis of experiences.

Quality assurance makes the process of production in a sense public: the customer can get an inside view of the process-description. Whether the activity is really going according to the description is confirmed by an independent external organisation. This is the area where need for the use of international standards arises. Such certificates have sense if they are acknowledged at as many places as possible. Basically, quality assurance is a standard concerning the form and content of the description of the activity. Here the exact performance of the process guarantees the

satisfactory product. The market justifies quality – which is adequate to the convention - in advance. Here it is to be remarked that quality assurance as such has a direct concern neither in assurance, nor in quality, in their classical meaning. In the system of concepts of quality assurance, quality always means to meet a concrete need, where e.g. final exam is needed, a final exam with a mark 2 is also quality. One expressive example of the concept of quality assurance is safety-fuse. A safety-fuse of 10 amperes is of quality, if it does not blow out in case of a current intensity of less than 10 amperes, but it does not resists a higher current intensity either, that is to say, it is what it has to be, what we declare it: a fuse of 10 amperes.

Quality assurance can be related to a standard e.g. European standard (EN) or to an international standard (ISO). The activity of the evaluating organisations is supervised by national bodies, which congregate in an international organisation, and function according to agreed standards. This does not mean, however, that quality assurance can only be operated in a standardised form. A certificate, however, can only be obtained from a standardised system.

Summing up, two large areas of quality are: quality management and quality assurance. Both of them can be built up, introduced and used standardised or independent from standards. Quality means that a product or service satisfies expressed or perceived needs of the users or beneficiaries (it is suitable for its function and of the institution ´s members).. In mass-production, manufacturers wanted to assure that the quality of the product should be steady. In the beginning they only controlled the quality of the final product. During last decades, however, quality systems are applied, to not only control the final product, but also the entire production process and all the needed requirements.. This way they prove that errors are discovered during production or service implementation and usually they can be successfully remedied. In the course of the progress, quality systems have been extended to more and more areas of production: total systems, which extended to the entire organisation, evolved towards total quality management.

1.2 Total Quality Management (TQM)

Total quality management is an approach including all issues of reaching quality, which embraces the entire operating of the organisation. It is management philosophy embracing all activities, with the help of which the needs and requirements of the clients, the audience, as well as the objectives of the organisation can be met in the most efficient and cost-effective way, in such a way that we make use of the possibility lying in the efforts to improve all employees continuously. Stress is on continuous improvement. According to TQM both quality management and quality improvement, as well as quality supervision is realised. TQM means a holistic approach, which induces individuals to look for the ways of improving operation of the organisation through independent action for the sake of a better operation, furthermore to recognise the close relation between satisfying the needs of the client and the objectives of the organisation.

Introduction of TQM requires management suitability and commitment, a wide training programme, the entire participation of staff, as well as acquaintance of such techniques and methods like statistical process engineering, Deming-cycle, Ishikawa diagram, Pareto chart, PEST and SWOT analysis, quality assurance and total quality supervision. It is generally believed that one of the most significant problems of TQM is to maintain the commitment of the operative management and the employees. In practice TQM is realised the following way: within the organisation so-called quality circles or groups are formed including people with the same working fields, tasks, or those who work on the same activity together. These groups analyse and improve their own work continuously.

1.3 EFQM model

In 1988 The European Foundation for Quality Management was founded, which worked out the EFQM model, basis for the European Quality Award. The model consists of 9 main criteria, which can be divided into two areas, the criteria group of conditions and that of results. The model is based upon self-evaluation, which does not control and evaluate the quality of a product or service, but the activity of the entire organisation. According to the model the satisfaction of the firms and organisations' customers, employees, social effect, and their business results are examined. Conditions and results are of the same importance in the model, in both groups a maximum of 500 points can be given, (the maximum of points possible to give for each criterion can be seen in the illustration) so the total is 1000 points. In the course of self-analysis the organisation analyses and scores itself in 9 areas. This way weaknesses and areas most requiring improvement can be revealed. After some time (generally one year) self-evaluation must be repeated, this way improvement can be measured. After determining the areas to be improved it is advisable to set up

improvement teams. The result of regular self-evaluation means the continuous development of both the organisation and the individuals. Among the 9 criteria it is Processes which is connected most to the system of ISO. The EFQM model has to be adapted to the area of education. Under Processes the process of education should be meant. The application of total quality management has the effect that the organisation, in the given case the educational institution gets more and more successful. This can be measured by the satisfaction of the customers (thus primarily the students).

1.4 Quality standards

When only final products were controlled, it was relatively simple to apply the standards concerning the features of the product. Standardisation of the process of production and service implementation is much more difficult. In spite of this there was an attempt to set up a standard which could be applied to each organisation and activity. The standard serial ISO 9001, which concerns quality systems, and is set up on the basis of British samples, was accepted in 1988 (ISO: International Organisation for Standardisation). The standard serial extended gradually, then the entire established standard system was reworked and the new issue was published in 1994 and 1996. The standards signed 9001, 9002 and 9003 give the backbone of the standard serial that concerns different activities. ISO 9001 is the quality assurance model of design, development, production, allocation and customer service; ISO 9002 covers only production, allocation and customer service; and ISO 9003 has an even shorter range of effect: final control and examination. The standard, however, contains so general formulations that it is very difficult to use in a given area without additional interpretation.

1.5 Establishment and operation of a quality assurance system

If an organisation decides for quality assurance, then the system developed and operated by should accommodate itself to the interests of the customers. Because of the complicated work division, some components of the product or service pass through several work phases till they get to the last users. Apart from that, the general customer interest can sometimes be considered as a public one. There are activities, products or business fields where also direct or indirect state supervision is felt. During the development of the quality assurance system, decision has to be made first of all on the way of the operation of the system, and to which areas of the activity should the quality assurance extend. The system can be worked out totally, or for only some particular activities. In the following, we describe the process of development and introduction according to the formal prescriptions of quality assurance systems.

After the basic decisions have been taken – in most cases with the help of consultants – the appointed activity field must be revised. The documents of quality assurance, the quality manual containing quality policy, the procedures and other directions must be prepared. After the preparations, the organisation can decide on the introduction and maybe on the external – independent - attestation of the quality assurance system. In such cases attestation is made by companies and persons having the right to attest. In the course of the audit, the attesting person/company investigates all the quality documents of the organisation, and checks on the premises whether the activity is going according to them. This investigation has limited duration, and cannot even be embracing. On the basis of the documents and the investigation on the spot, the accrediting person/company can issue the certificate according to the standard model or profile of quality.

1.6 What are the benefits from the introduction of quality assurance?

- A clear system of operation
- Operation, which is more independent from individuals
- Greater effectiveness
- A clearer system of roles, responsibilities, and spheres of authorities
- Clearer definition of rights and duties of participants
- Recognition by external (sometimes prestigious) institutions.

1.7 Steps towards the introduction of a system of quality assurance

1. Survey of existing methods
2. General training

3. Setting up of the “chiefs of staff” of quality from the staff of the institution
4. The “chiefs of staff” of quality document its quality policy
5. Preparation of a work-plan
6. Planning the main outlines of the quality system
7. Appointment of the person responsible for the programme
8. Selection of the adequate model
9. Preparation of the first version of the quality assurance manual
10. Development of procedures, preparation of directions
11. Carry out the first internal audit
12. Error corrections
13. Supervision of documents
14. Possible correction of such documents
15. Carry out the next internal audit
16. Error corrections
17. Supervision of documents
18. Possible corrections and adaptations for improvement

1.8 Economic appraisal of quality assurance

Quality assurance implies costs. These costs increase significantly if an externally attested quality system is introduced. Preparation itself needs extra time-input, which causes additional charges, and the costs of attestation and maintaining the system are also high. Costs can be compensated through the benefits resulting from the adequate quality of the activity. After a short transition period, the costs related to the errors of operation decrease abruptly because of the obstruction of the errors of operation. Besides, costs are recovered mainly through the improvement of market positions: it is easier to gain the confidence of the customers; the costs of customer-service and reparations are lower.

2 Analysis

The first step in the creation of an e-learning course is analysis, the aim which is to define the target groups, their needs and the anticipated outcome of the training. The output of this stage (analysis) is a conception of the course. This conception is the input of the "design and development" stage. The result (output) of the "design and development" stage is designed or developed course materials that are ready for production. The proposed checklist for this phase is:
A. Did the analysis indicate and identify:

- The type and scope of education?
- The market segments of the e-learning?
- The volume of learners?
- The potential students´ skill levels?
- The motivational factors of the learners?
- Support of the learners from their company, family?
- How much time and money will the learners contribute to the training?
- The business requirements, expressed in measurable terms?

B. Does the Analysis Report include:

- Expected learning outcomes?
- Most important customer needs?
- The business aspects?
- The job skills and knowledge of learners, and their work environment?

3 Design and Development

In comparison with face to face education and training, course design and development in an e-learning environment is a more laborious undertaking. The course needs more flexibility, as the learner group is mostly greater and less defined; the course content needs far more detail and elaboration (better explanation, embedding of exercises and assignments); learner ´s support must be more carefully planned; etc. Output of the design process is a course description, based on the outcomes of the analysis to plan the development, production, delivery and evaluation of the course. The design process should create course aims, outline the contents, outline the delivery

system and outline the evaluation strategy. The development uses the course description, as the result of the design stage, to shape the actual course. The development process consequently goes along similar pathways as the design process, but working out the various steps. This process will imply specifying course objectives, matching the learner ´s profile, developing the contents, selecting and preparing media, planning the evaluation strategy and adapting materials. The proposed checklist for this phase is:

A. Did it become clear during design:

- What exactly is expected?
- How much time is available?
- What kind of combination of team members is needed?
- What kind of input is expected from them (type of expertise, time constraints, previous experiences in e-learning)?
- How the team will communicate?
- When and how many meetings will be organised?
- What possibilities (e.g. technical) are available for the developers?
- What kind of equipment is needed?
- Are design objectives well defined?
- Is a list of factors to be measured, which indicate, whether objectives are reached, prepared for defining objectives?

B. Were the following issues taken into consideration during design:

- Previous knowledge?
- Previous skills?
- Cultural background?

C. Does the plan include details about the following:

- Motivate learners?
- Set previous knowledge and experience of learners in motion?
- Take their skills and cultural background into consideration?
- Consider different learning styles?
- Provide the learner with sufficient feedback to be able to evaluate, whether he is developing in direction of the objectives (self-control)?
- Content must have direct concern to application (and give meaningful educational tasks and directions)?
- The course must motivate for active participation?
- The course must make use of the experiences of the learner (especially the professional ones)?
- It must make self-control possible for the learner (provide tests for understanding and perfect acquisition)?
- It must take individual learning style of the learner into consideration?

D. Were media and format selected consciously taking the following into consideration:

- Objectives and nature of the course content?
- Availability of media, and ability of learners (and teachers) to use special media?
- Environmental bounds (e.g. mobility of learners, distance from the institution, size of the learning group, etc)?
- Economical character of development and delivery?

E. Were the following resources used for design:

- Existing materials?
- Other e-learning courses in the same or in a similar topic (written materials, software packages, multimedia packages, web-based education, practical packages, etc)?
- Traditional, not e-learning materials (handbooks, textbooks, workbooks, etc)?
- Literature (articles in professional magazines, books)?
- Colleagues (in the same professional field)?
- Other resources (handbooks, publications, newspaper articles, encyclopaedias, encyclopaedic and special CD-ROMs, etc.)?

4 Production

Production is the material (tangible) outcome of previous design and development stage. The course provider should give consideration to processes to be operated and maintained, to personnel

training and qualification requirements for process activities and to facilities, equipment, materials and software necessary to support a process. The checklist proposed is:

A. Do course materials include the following:

- Title?
- Author?
- Date of publication?
- Initial requirements to attend the course?
- Learning time demand?
- Table of contents?
- Users' guide?
- Learning outcomes?
- Assessment modes?

B. Do course descriptions include definitions of the sphere of activity and organisational diagrams providing detailed information that is concerned with the learners' viewpoint?

5 Delivery

The output of the previous stage (production) is an amount of course materials that is ready for delivery. These materials and other resources are the input of delivery stage; in other words, course running. The results (output) of delivery stage are the delivered course and the completed course from the learner's point of view. The checklist proposed is composed by:

A. Does the advertisement include all the necessary information concerning the:

- Target group?
- Admission requirements?
- Objectives, content, timetable of the course?
- Course materials?
- Method(s) of e-learning (virtual modes)?
- Different learning activities?
- Availability of teachers and tutors?
- Learner assistance and facilitation?

B. Do the learning contracts include the:

- Course name and description?
- Price?
- Possibility for payments?
- Procedure(s) of payment?
- Copyright and proprietary rights of course materials?
- Necessary pre-qualification?
- Services provided by the institution and e-learning supplier?
- Duration of the learning contract?
- Guarantees?
- Reimbursement agreement?
- Cancellation deadline?
- Role of employer?

C. Do the conditions exist to deliver course materials for the learners in time, and do they include the following:

- Course objectives and requirements?
- Study guide, selected passages, glossary, index?
- Attainable study aims according to the knowledge of the enrolled students?
- Exact collaboration plan, schedule?
- Guide to quality learning?

D. Is there continuous contact with the tutors?

E. Are the following conditions met in the course of the delivery:

- Clear definition of learning objectives?
- Appropriate manner of lecturing?
- Clear course structure?
- Appropriate course sequence?
- Appropriate timing?
- Clear, continuous communication, dialogue?

- Quick feedback?
- Creation of a friendly, supportive, rewarding learning environment?

F. Is there a planned and regular learning-evaluation activity

6 Evaluation of the e-learning course

Evaluation of the e-learning course is the meaning or interpretation of the data from the assessment by learners, by other faculty, by administrators or by accrediting agencies. The results of an assessment process should provide information which can be used to determine whether or not intended outcomes are being achieved and how the e-learning materials can be improved. In the assessment process it is important to distinguish between formative and summative type. Formative assessment is the collection of data and the feedback of the results on an ongoing basis: this type of assessment is designed to provide information for the purpose of improving the e-learning material being assessed. Summative assessment is designed to produce information that can be used to make decisions about the effectiveness of the e-learning process. The following six stages present an outline for the development of an evaluation plan. Generally, the sequence of the steps is unidirectional. The stages are illustrated with examples on the following pages. The examples follow the progress of a unique objective like “assure that learners can create homepages in the web”. The steps are:

- Identify goals and learning objectives
- Develop performance criterion for each learning objective
- Determine the practice to be used to achieve goals
- Select and apply assessment methods for each learning objective
- Define correct feedback channels to get information useful for assessment
- Clarify the criteria of acceptable performance

The main questions of the checklist are:

- Are the goals identified?
- What is to be achieved?
- Are the specific objectives identified for each broad goal?
- Under what circumstances will you know the goal has been achieved?
- Which performance criteria have been developed for each objective?
- Are all of the practices to be determined to achieve training goals?
- What are the selected assessment methods for each objective?
- Have you chosen data collection methods?
- Have you used specified methods to collect evidence?
- Have you analysed evidence and compared against performance criteria using analysis appropriated to the method chosen?
- Did you determine the feedback channels?
- Have you evaluated whether the performance criteria were met and the objectives were achieved?